

9/18/13

Goal: Target D - Solve algebraic and arithmetic problems involving angles using '*part + part = whole*' and bisectors.

Agenda

- Review homework
Worksheet 2 - Angle Addition
- Section 1.4 day 3 - Angle Bisectors
- Start homework
Worksheet 3 - Angle Addition with Bisectors
- Mini Quiz on Thursday (tomorrow)

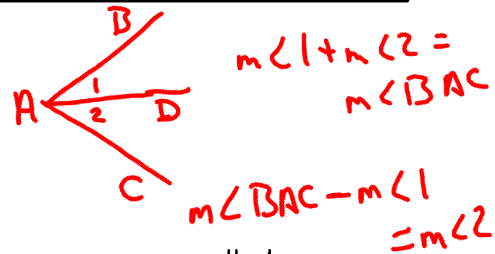
Section 1.4 day 3 - Angle Bisectors

Target D

Review:

Part + Part = Whole

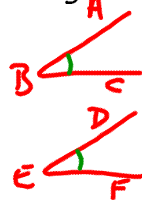
Whole - Part = Part



New Material:

Congruent Angles:

Angles that have the same measure are called *congruent angles*.



ANGLE MEASURES ARE EQUAL ANGLE ARE CONGRUENT

$$m\angle B = m\angle E \quad \angle B \cong \angle E$$

Angle Bisector:

An angle bisector is a ray that divides an angle into two angles that are congruent.

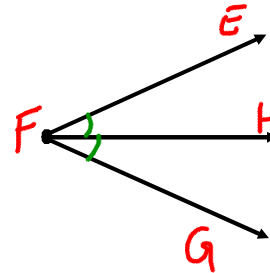
Algebraically

\overrightarrow{FH} BISECTS $\angle EFG$

$$m\angle EFH = m\angle HFG$$

$$\angle EFH \cong \angle HFG$$

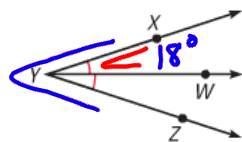
Visually



This is similar to how a MIDPOINT splits a line segment into two congruent segments.

Examples:

In the diagram at the right, \overrightarrow{YW} bisects $\angle XYZ$, and $m\angle XYW = 18^\circ$. Find $m\angle XYZ$.



$$m\angle XYW + m\angle WYZ = m\angle XYZ$$

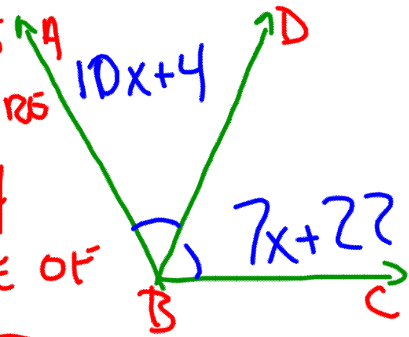
$$18^\circ + 18^\circ = 36^\circ$$

$$m\angle XYW = m\angle WYZ$$

$$18^\circ = 18^\circ$$

Using Algebra:

RAY \overrightarrow{BD} BISECTS $\angle ABC$. THE MEASURE OF $\angle ABD = 10x + 4$ AND THE MEASURE OF $\angle DBC = 7x + 22$

FIND $m\angle ABC$

$$m\angle ABD = m\angle DBC$$

$$10x + 4 = 7x + 22$$

$$\begin{array}{r} -7x \\ \hline 3x + 4 = 22 \end{array}$$

$$\begin{array}{r} -4 \\ \hline 3x = 18 \end{array}$$

$$\begin{array}{r} \frac{3x}{3} = \frac{18}{3} \\ \hline x = 6 \end{array}$$

$$x = 6$$

$$m\angle ABC = m\angle ABD + m\angle DBC$$

$$= 10x + 4 + 7x + 22$$

$$= 17x + 26$$

$$= 17(6) + 26$$

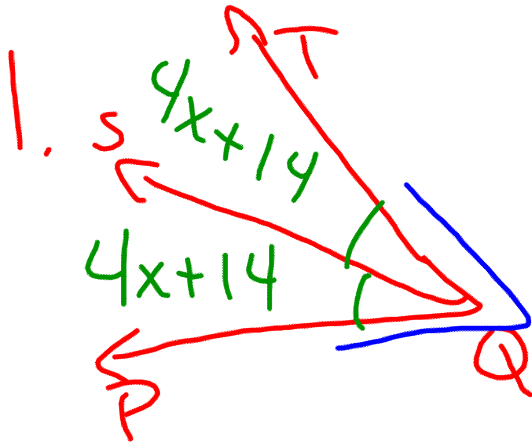
$$= 102 + 26$$

$$= 128^\circ$$

Summary:

An angle bisector divides an angle into two congruent angles. This is the same idea as what a midpoint (or bisector) does to a line segment.

If angles are congruent, they have the same measure.
If angles have the same measure, they are congruent.



\overleftrightarrow{QS} BISECTS
 $\angle PQT$

$$m\angle PQT = 60^\circ$$